

Wind Chill

From the user , we are given an air temperature (T) and a wind speed ($Wind_{sfc}$).

In order to calculate the Wind Chill, the temperature must be converted to degrees Fahrenheit ($^{\circ}\text{F}$).

To find out how to convert the temperature, see the link below:

<http://www.srh.noaa.gov/elp/wxcalc/formulas/tempConvert.pdf>

Also, in order to calculate the Wind Chill, the wind speed must be converted to miles per hour (mph).

To find out how to convert the wind speed, see the link below:

<http://www.srh.noaa.gov/elp/wxcalc/formulas/windConversion.pdf>

Then, the Wind Chill can be calculated using this formula:

$$\begin{aligned} WindChill = & 35.74 + (0.6215 \times T) - (35.75 \times Wind_{sfc}^{0.16}) \\ & + (0.4275 \times T \times Wind_{sfc}^{0.16}) \end{aligned}$$

Because the user might need the Wind Chill in Watts per meter squared ($\frac{W}{m^2}$), it can be calculated using an air temperature in degrees Celsius ($^{\circ}\text{C}$) and a wind speed in meters per second (m/s):

$$\begin{aligned} WindChill = & \left(12.1452 + 11.6222 \times \sqrt{Wind_{sfc}} - 1.16222 \times Wind_{sfc} \right) \\ & \times (33 - T) \end{aligned}$$